

REMARKS

This is a full and timely response to the outstanding FINAL Action mailed August 12, 2005. Upon entry of the amendments in this response, claims 1 - 23 remain pending. The Examiner is thanked for the thorough examination of this application and the continued allowance of claims 11-23 (and the indication that claims 7 and 10 contain allowable subject matter). In particular, Applicant has amended claim 1 so as to clearly define over the cited art of record. Support for the amended language can be founded at various portions of the application. By way of example, Fig. 2d shows a substrate 100 comprises a film to be etched 104 and an overlying masking pattern layer 110. Moreover, the additional cleaning process is performed before the deposited polymer layer reached such a degree as to induce lateral etching on the layer 104 of the next substrate 100 (see page 17, lines 8-11 of the specification). Accordingly, no new matter has been added to the application by the amendment made herein. Reconsideration and allowance of the application and presently pending claims are respectfully requested.

Rejections under 35 U.S.C. 102

The Office Action rejected claims 1-2, 4-5, 8 under 35 U.S.C 102(e) as allegedly anticipated by *Qian et al.* (U.S. Patent No. 6,699,399). Moreover, in the Response to Arguments section of the Final Office Action, the FINAL Office Action states that “*Qian et al.* clearly teaches in col. 3, lines 48+, col. 6, lines 24+, cleaning process to be performed... such a degree as to induce lateral etching on the next film (selectivity between layer (22) and layer (24), i.e. layer (22) etched faster than etching layer).” With respect to the remaining claims, Applicants respectfully traverse the rejection.

With respect to *Qian*, *Qian* discloses substrate process methods, in which etchant gas is provided in the chamber while providing a cleaning gas (see col. 3, lines 48 to col. 6, lines 24). Moreover, *Qian* discloses multiple stages are used to etch multiple layers on the substrate, and the cleaning gas is introduced in at least one of stages to remove the etch residue deposited on the chamber surfaces in one or more of the multiple etching steps. (see col. 12, lines 15-20 and Fig. 3). Additionally, *Qian* discloses the chamber surfaces are cleaned and conditioned by the etchant and cleaning gas combination step, without requiring a separate chamber conditioning or seasoning step (see col. 11, lines 2-5). That is, cleaning process disclosed by *Qian* is performed during a single substrate etching (i.e. the cleaning and the etching are simultaneously performed), rather than between etchings for different substrates.

Moreover, in the background of *Qian*, *Qian* discloses that attempting to remove the etchant residue **during the etching process** results in substantially lowering the etching selectivity ratio of the layer (22) and the layer (24) (see Figs. 1a-1d and col. 2, lines 39-67). In fact, *Qian* teaches a layer 24 underlies a layer 22 having a relatively thicker portion and a relatively thinner portion. At a certain time during the etching process, the thinner portion is etched through and etching of the underlying layer 24 begins, while the thicker portion is still being etched. This requires that the layer 24 be etched sufficiently slowly relative to the rate of etching of the layer 22, that entire layer 24 below the thinner portion of the layer 22 is not etched through, before completion of etching the thicker portion of the layer 22 (See col. 2, lines 57-67). In short, higher selectivity between layer 22 and layer 24 can prevent the layer 24 below the thinner portion of the layer 24 from being etched through. Note that it is irrelative to “lateral etching on the next or underlying film”.

Turning now to independent claim 1, that claim recites:

1. A semiconductor process for controlling etching profile, comprising the steps of:
providing a plurality of substrates, wherein each substrate comprises a film to be etched and an overlying masking pattern layer thereon;
and
successively etching the film to be etched on each substrate in a plasma chamber using the masking pattern layer as an etch mask, a polymer layer being deposited over the inner wall of the plasma chamber during the etching;
wherein an intermediary cleaning process is performed in the plasma chamber between the etchings before the deposited polymer layer reaches such a degree as to induce lateral etching on the film to be etched of the next substrate.

(Emphasis Added).

Applicants respectfully submit that *Qian* does not teach or otherwise disclose at least the features/limitations emphasized above in claim 1. For example, *Qian* discloses or teaches the cleaning is performed **during etching a single substrate**, rather than **between etchings of substrates**. Moreover, *Qian* does not disclose or teach cleaning process is performed before the polymer layer reaches such a degree as to induce lateral etching on the film to be etched on the next film. For at least this reason, Applicants respectfully request that the rejection of claim 1 be removed and that claim 1 be placed in condition for allowance. Since claims 2, 4-5 and 8 are dependent claims that incorporate the limitations of claim 1, Applicants respectfully request that these claims also be placed in condition for allowance.

Rejections under 35 U.S.C. 103

The Office Action indicates that claims 3, 6 and 9 are rejected under 35 U.S.C. 103 (a) as being unpatentable over *Qian* in view of *Zhong* (U.S. 6,127,927). Applicants respectfully traverse the rejection.

In particular, Applicants respectfully assert that the combination of *Qian* and *Zhong* is legally deficient for the purpose of rendering claims 3, 6, and 9 unpatentable, because the combination does not teach or reasonably suggest at least the features/limitations emphasized above in claim 1 as lacking in *Qian*. That is, *Zhong* does not teach or reasonably suggest these features/limitations either. Since claims 3, 6, and 9 are dependent claims that incorporate the features of claim 1, Applicants respectfully assert that these claims are in condition for allowance. Additionally, these claims recite other features that can serve as an independent basis for patentability.

Accordingly, for at least these reasons (and reasons previously argued in the file history of this application), Applicant respectfully submit that all claims define over the cited art of record.

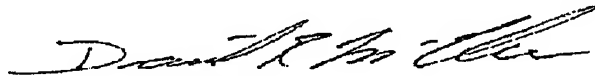
CONCLUSION

In light of the foregoing, Applicants respectfully submit that all objections and/or rejections have been traversed, rendered moot, and/or accommodated, and that the pending claims are in condition for allowance. Favorable reconsideration and allowance of the present application and all pending claims are hereby courteously requested. If, in the opinion of the Examiner, a telephonic conference would expedite the examination of this matter, the Examiner is invited to call the undersigned attorney at (770) 933-9500.

A credit card form accompanies this submission and authorizes the charge for the accompanying RCE application and any appropriate extension fees. No additional fee is believed to be due in connection with this response. If, however, any additional fee is due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

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